MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2018/2019

DCA5018 – ELECTRIC CIRCUIT

(Diploma in Electronic Engineering)

27 MAY 2019
2:30 PM – 4:30 PM
(2 HOURS)

INSTRUCTIONS TO STUDENT

1. This question paper consists of **4** pages (excluding the cover page).

2. Answer **ALL** questions. All necessary working steps must be shown.

3. Write all your answers in the answer booklet provided.

QUESTION 1 [25 Marks]

For the circuit shown in Figure 1, determine the following:

i) The total resistance. [4 marks]

ii) Currents I_1, I_2 and I_3. [9 marks]

iii) Current flowing through each resistor. [4 marks]

iv) Voltage across each resistor. [4 marks]

v) Power dissipated by R_1 and R_2. [4 marks]

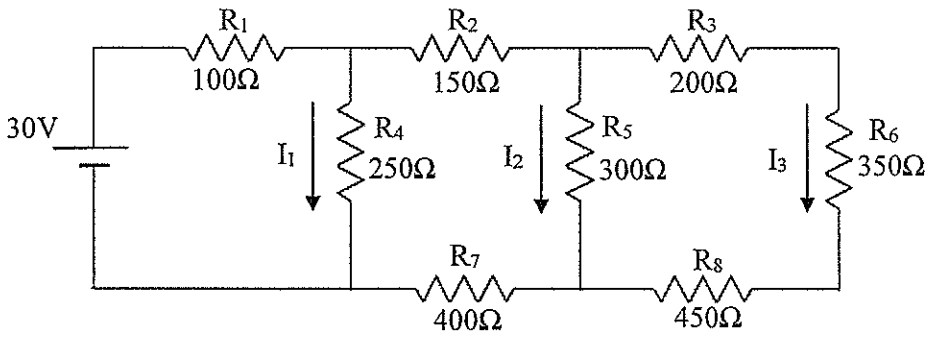

Figure 1

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QUESTION 2 [25 Marks]

a) By using Branch Current Analysis, calculate the branch current I_1, I_2 and I_3 as shown in Figure 2(a).

[11 marks]

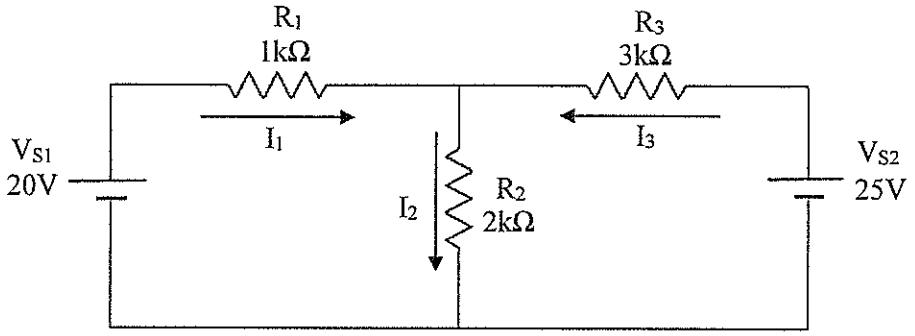

Figure 2(a)

b) By using Mesh Analysis, determine the voltage drop at R_1 as shown in Figure 2(b).

[14 marks]

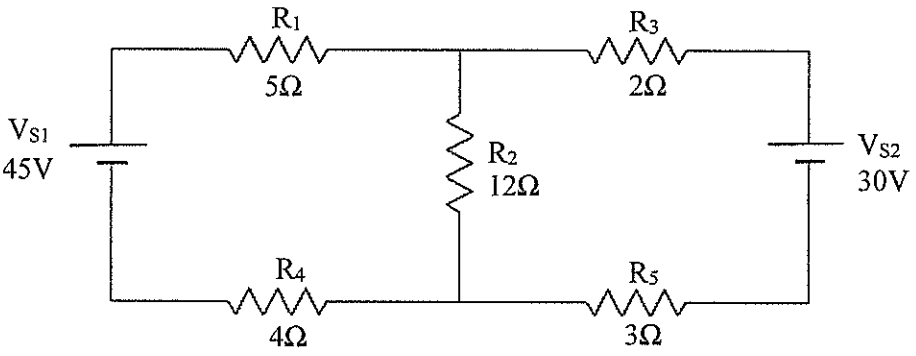

Figure 2(b)

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QUESTION 3 [25 Marks]

By referring to the RLC circuit as shown in Figure 3:

i) Sketch the equivalent circuit representation in frequency domain. [8 marks]

ii) Calculate the total impedance in the circuit. [5 marks]

iii) Calculate the steady state currents $i(t)$,$i_1(t)$ and $i_2(t)$. [12 marks]

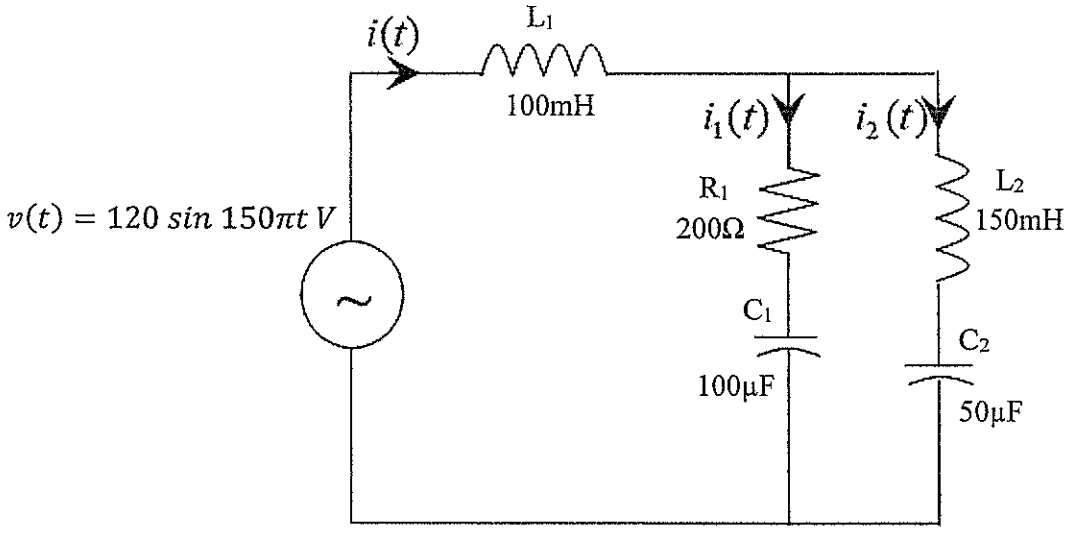

Figure 3

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QUESTION 4 [25 Marks]

a) With the aid of a suitable diagram and equation, define ***Kirchhoff's Voltage Law (KVL)*** and ***Kirchhoff's Current Law (KCL)***.

[10 marks]

b) Define ***steady-state*** condition.

[2 marks]

c) State **FOUR** behaviors of capacitors in DC circuits.

[4 marks]

d) With the aid of a suitable diagram, define ***resonance*** in the context of a series RLC circuit.

[5 marks]

e) Explain the difference in energy storage between RC and RL circuit.

[4 marks]

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